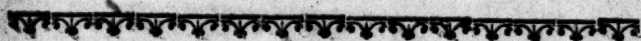
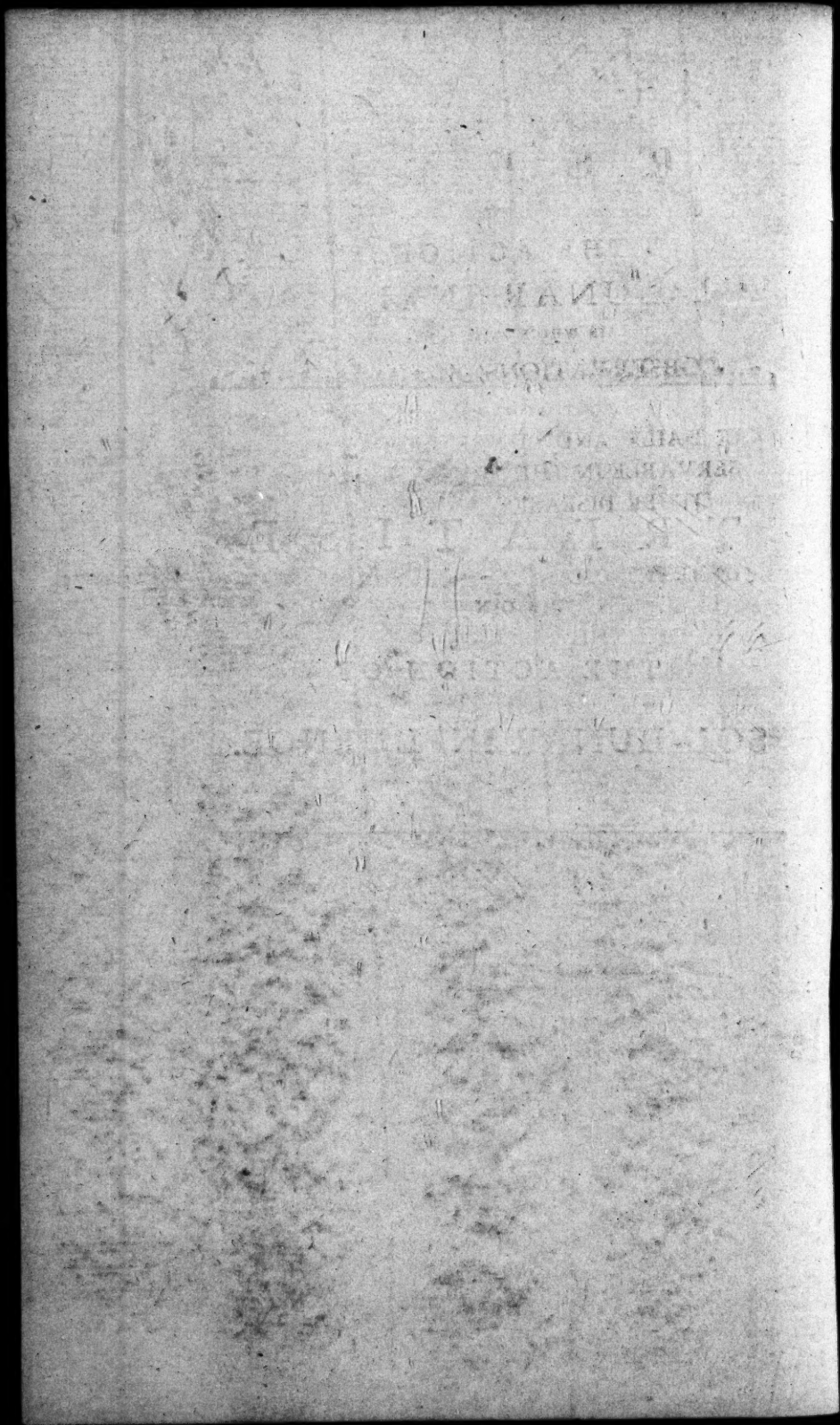


(2.)



T R E A T I S E
ON
THE ACTION OF
SOL-LUNAR INFLUENCE.





(2.)

A
T R E A T I S E
O N
THE ACTION OF
SOL-LUNAR INFLUENCE,
IN WHICH IT IS INFERRED,
FROM OBSERVATIONS ON THE URINE, &c. &c.
THAT IT OCCASIONS
THE DAILY AND LUNAR REVOLUTIONS OB-
SERVABLE IN THE STATE OF FEVERS, OF
OTHER DISEASES, AND OF HEALTH,
BY PRODUCING
COINCIDENT CHANGES IN THE CONDITION OF
THE CONSTRICTIVE POWER AND BALANCE
OF THE VASCULAR SYSTEM;
AND
THAT THERE IS REASON TO BELIEVE THAT THE SOL-
LUNAR INFLUENCE EXERTS ITS DOMINION OVER
EVERY PRODUCTION, AND IN EVERY OPERA-
TION AND REVOLUTION IN NATURE.

By FRANCIS BALFOUR, M.D.
S. R. M. E. S. H.

*Causas rerum naturalium non plures admitti debere quam quae
et verae sint et earum phaenomenis explicandis sufficiant.*

NEWTON. REG. PHILOS. I.

EDINBURGH:
PRINTED BY WILLIAM SMELLIE.

MDCCXCI.

T R E A T Y



THE AMERICAN
SOL-LUNAR

FROM OBSERVATIONS ON THE URINE

THE DAILY AND SEASONAL REVOLUTIONS OF
SERIAL AND OF THE
OF THE DAILY AND SEASONAL

CO-ORDINATE
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THIS

T R E A T I S E

IS DEDICATED

TO

COLONEL NESBIT BALFOUR,

AND TO

MAJOR ARTHUR BALFOUR,

BY THE

A U T H O R,

IN TESTIMONY

OF HIS ESTEEM.

~~T R E A T I S E~~

IS OEDIPAL E.

...the manner by which we established our
...the laws of the Sol-
COLONEL HERBERT WATSON
...we found it necessary to let our
...the latter, comprehended under
...and to
...in order to
...the course of our
MAJOR ARTHUR HALL
...we have now
...by a unique Analysis
...the first and most simple pro-
...our observations originated
...the appearance of the Urine
...which have been led to inferences in-
...in medicine and philosophy in general
OF THE URINE

P R E F A C E.

IN the induction by which we established our Axioms respecting the Laws of the Solar Influence, we found it necessary to set out with certain general facts, comprehended under the general term of Symptoms.—In order to enable other Inquirers to trace the course of our reasoning to its remotest source, we have now undertaken to exhibit, by a minute ANALYSIS of these Axioms, the first and most simple phenomena with which our observations originated, and particularly the *Appearances of the Urine*; from which we have been led to inferences important in medicine and philosophy in general.

P R E F A C E

IN the selection by which we established our
system regarding the Law of the Sol-
lution, we have endeavored to let our
work contain general principles, in order to en-
able other inquirers to trace the course of our
reasoning to its terminal point, we have now
endeavored to exhibit, by a number of extracts
of their actions, the first and most simple prin-
ciple, one with which we observed and originated,
and particularly the development of the same;
from which we have been led to subsequent in-
quiries in medicine and philosophy in general.



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(211)

M O T E S

81

A. This respecting the nature of the

82

B. This respecting the position

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CORRIGENDA.

Pag 3. lin. 11. for Asia read India.

11. 15. for symptoms read Paroxysms.

20. 6. for purpose read purpose.

**39. 5. dele nubilated or tubeculated (1.) and
insert Lutulent.**

40. 22. for observations read deviations.

A
T R E A T I S E
O N
THE ACTION OF
SOL-LUNAR INFLUENCE.

CHAPTER I.
THE INTRODUCTION TO THE ANALYSIS.

SECTION I.
THE TRUTH OF THE AXIOMS ADVANCED RESPECTING THE SOL-LUNAR INFLUENCE TO BE ASCERTAINED BY RECURRING TO THE FIRST AND MOST SIMPLE PHENOMENA WITH WHICH OUR INDUCTION COMMENCED.

- I.
1. **A** CERTAIN *spasmodic state, excited by infection, and regulated in its revolutions by the sol-lunar influence,* conveys an idea comprehending the whole theory of infectious fevers.

PART II.

A

The

The doctrine of the febrile spasmodic state, first delivered by Hoffman, and afterwards more fully explained and diffused by Cullen, and his scholars, seems, with certain limitations, to be almost universally adopted by the present age.

The nature and extent of febrile infection, hitherto only anticipated and assumed upon partial observation, is now placed upon the basis of an extensive induction, by the indefatigable and judicious industry of Doctor Robertson *.

The

* Vide an Essay on Fevers, wherein their theoretic genera and species, and various denominations, &c. &c. are reduced under their characteristic genus, febrile infection, by Robert Robertson M. D.

The discovery of the laws of the sol-lunar influence led me to infer that all the various forms of remitting infectious fevers were nothing more than so many varieties of the same disease, occasioned by that influence exerting itself under different circumstances; and to anticipate the conclusion which Dr Robertson has established, upon direct observation, long before I was acquainted with his opinion

The laws of the sol-lunar influence, formerly superficially observed by others, have been explained in our Treatise on Putrid Intestinal Remitting Fevers, in a manner, we presume, not to be found in any preceding record of medicine.

2. Reconciling and combining these different principles, I formed the system of theory and practice which was offered to the public in that treatise.

II.

1. In Europe, the theory of sol-lunar influence has met with little encouragement from the professors of medicine. Those who allow that it may prevail in ~~At~~ *India*, nevertheless insist that it does not shew itself in the northern latitudes of this quarter of the globe.

If physicians who have delivered this opinion can declare that they have watched the state of the symptoms,

pinion on this subject; and he will perceive that it is a conclusion which unavoidably arises from these premises.

toms, and examined the urine, at the coming on, in the middle, and at the going off, of the different paroxysms and remissions, during the whole course of the disease ; that they have likewise particularly attended to the character of the symptoms and urine, at the coming on, in the course, and at the going off, of the different lunar periods, and interlunar intervals ; that they have continued these observations, in an extensive practice, for a length of time ; and that, after all, they have been able to discover no coincidence or connection similar to that which we have described ; we shall then allow that they have formed their opinion upon reasonable grounds, and have been guilty of no impropriety in giving it to the public.

If, on the other hand, this opinion has been formed from observations collected in the course of the ordinary visitations that are paid to the sick in this country by their physicians, whether in hospitals or in private practice, I must then affirm, that it has been advanced upon grounds that are in every respect imperfect and insufficient. But, what is worse, it is an opinion which is
prejudicial,

prejudicial, because it tends to prepossess the mind of the public, and to lead it astray from the investigation and discovery of truth.

2. To resist and prevent this consequence, as far as it may be done by the voice of a single individual, I think it a duty, which I owe to mankind, to declare, in the most public and solemn manner I am able, that, since I came to Scotland; I have had an opportunity of attending to more than twelve different cases of bilious fever ; and that, in all of them, I discovered an evident coincidence of their daily and septenary revolutions with those of the moon, similar to that observed in India. In several of these cases I had an opportunity of observing the urine with attention, as well as the symptoms. In the rest, I formed my opinion from the symptoms only.

III.

1. It is the first object of this Treatise to point out a regular and simple method of investigation, by which

which the facts and arrangements, from which the doctrine of the sol-lunar influence has been inferred, may be readily traced and examined; so that the foundation of this theory may be brought to a trial by every inquirer, and determined to be true or false.

CHAP.

CHAPTER II.

THE ANALYSIS.

SECTION I.

**THE FIRST AND MOST SIMPLE PHENOMENA WITH
WHICH OUR INDUCTION COMMENCED TO BE
EXHIBITED BY FOLLOWING A RETROGRADE
OR DESCENDING ANALYSIS.**

IV.

1. **I**NVESTIGATING the doctrine of the solar-lunar influence, we proceeded by a progressive or ascending scale of observation. It is our present purpose to examine it by a scale of observation which retrogrades or descends. By this means we shall be conducted to the first and most simple phenomena with
which

which our observations began ; and upon the reality of which the truth of the whole system we have endeavoured to establish, must ultimately rest.

2. In prosecuting the ascending mode of investigation, we obtained three general rules or axioms, in which our ideas of the general laws of the solar influence are expressed ; with certain clauses explaining in what respects these general laws seem to be modified or restrained. By exhibiting these axioms analysed and reduced to the different propositions they contain, and these again to the most remote principles or phenomena from which they are inferred, we shall perform the task we have undertaken, and in the manner we proposed.

VI

The axioms we obtained by our first investigation are these :

AXIOM

A X I O M I.

The force of the sol-lunar influence is much greater during the meridional periods than their respective intermeridional intervals ; and seem to be somewhat greater during the nocturno than their respective diurno meridional periods ; and somewhat greater during the ^{evening} morning than the ^{Morn-} ~~even-~~ ^{ing} ~~ing~~ intermeridional intervals.

A X I O M II.

The force of the sol-lunar influence is much greater during the lunar periods than their respective interlunar intervals ; and, during the novilunar and plenilunar periods, is nearly the same, and also during their respective interlunar intervals, at the beginning and end of which it seems to be greater than in the middle.

B

A X I O M

A X I O M III.

The force of the sol-lunar influence is considerably greater during the equinoxial periods than their respective inter-equinoxial intervals ; and somewhat greater during the autumn than the vernal equinoxial periods.

THE

THE ANALYSIS OF AXIOM FIRST.

AXIOM I. Contains the following Propositions :

i. The force of the sol-lunar influence is much greater during the meridional periods than their respective intermeridional intervals ;—inferred,

A. From the prevailing tendency of the febrile paroxysms to coincide with the meridional periods ;—inferred,

A. From the superior number of instances in which the febrile paroxysms were actually observed to coincide with the meridional periods ;—inferred,

a. From the presence of that superior degree of the principal symptoms which distinguishes the character of the febrile ~~paroxysms~~ *Paroxysms*, viz. the pulse more quick and hard than in the remissions, the skin more hot and dry, the tongue more dry and parched, the expectoration more scanty, the belly more bound, the face more flushed, the eyes more confused and red, the head more deranged, the sleep more interrupted and disturbed, the pain of partial affections more severe, &c. &c. ; and, above all,

b. From the tendency of the urine to be *more thin* than in the remissions ;—inferred,

aa. From being *less lutulent, nubiferous, nubipulvisiferous, or pulvisiferous*, than in the remissions.

B. From

B. From the prevailing tendency of the febrile remissions to coincide with the intermeridional intervals ;—inferred,

a. From the superior number of instances in which the febrile remissions were actually found to coincide with the intermeridional intervals ;—inferred,

a. From the presence of that inferior degree of the principal symptoms which distinguishes the character of febrile remissions, viz the pulse less quick and hard than in the paroxysms, the skin less hot and dry, the tongue less dry and parched, the expectoration less scanty, the belly less bound, the eyes less confused and red, the head less deranged, the sleep less interrupted and disturbed, the pain of partial affections less severe, &c. &c. ; and, above all,

b. From the tendency of the urine to be *less thin* than in the paroxysms ;—inferred,

aa. From being *more lutulent, nubiferous, nubipulvisiferous, or pulvisiferous*, than in the paroxysms.

2. And seems to be somewhat greater during the nocturno-meridional than their diurno-meridional periods ;—inferred,

A. From the prevailing tendency of the nocturno-meridional paroxysms to make their appearance sooner, to be more violent, and to continue their returns after the diurno-meridional paroxysms have ceased to appear ;—inferred,

a. From

a. From their having been actually observed in most cases, since I began to attend to this circumstance, to appear sooner; this, however, was only lately.

b. From having always observed that the symptoms in most cases were more severe.

c. From their being actually observed to continue their returns in the course of the interlunar intervals, long after the diurno-meridional paroxysms have ceased to appear.

B. From the prevailing tendency of the diurno-meridional paroxysms to appear later, to be less violent, and to continue returning for a shorter time;—inferred,

A. From their having been actually observed in most cases, since I began to attend to this circumstance, to appear later; this, however, was only lately.

b. From their having been actually observed to be less severe in most cases.

c. From their having been actually observed to disappear, or at least to become more obscure, in the interlunar intervals, whilst the nocturno-meridional paroxysms continue to return with considerable force.

3. And somewhat greater during the evening than the morning intermeridional intervals;—inferred,

A. From

A. From the prevailing tendency of the morning intermeridional remissions to be more complete than those of the evening;—inferred,

a. From observing the symptoms of the morning intermeridional remissions in every case more distinct than those of the evening.

B. From the prevailing tendency of the evening intermeridional remissions to be less complete than those of the morning;—inferred,

a. From observing that the symptoms of the evening intermeridional remissions were always less distinct than those of the morning; and from their becoming so obscure during the 3d or 4th last days of the lunar period, as to be scarcely observed; but especially in the first lunar periods.

THE

THE ANALYSIS OF AXIOM SECOND;

AXIOM II. Contains the following propositions :

1. The force of the sol-lunar influence is much greater during the lunar periods than the respective interlunar intervals ;—inferred,

A. From prevailing tendencies in the lunar periods, viz.

a. The prevailing tendency of the meridional paroxysms of the lunar period to attack, to increase in violence, and to continue ;—inferred,

a. From having observed that the meridional paroxysms of the lunar periods in most cases made their appearance first.

b. From having observed that in most cases the meridional paroxysms of the lunar periods pitched as it were upon a higher key, and were longer and more violent than in the interlunar intervals.

c. From having observed that the meridional paroxysms of the lunar periods, especially of the first and second, seldom or never ceased of their own accord, but, on the contrary, became more and more violent and obstinate, from the beginning of the period to the end.

a. The prevailing tendency of the intermeridional remissions of the lunar periods to become, from the beginning to the end of the period, gradually less distinct, especially of the evening intermeridional remission, which, about the middle of the period, is apt to become so obscure as not to be perceived ;—inferred,

a. From

- a. From having observed that, in almost every case, particularly in the first and second lunar period, the symptoms of remission did actually become less distinct, especially those of the evening remission; which become so obscure about the middle of the period as not to be observable.

B. From prevailing tendencies in the interlunar intervals, viz,

- a. A prevailing tendency in the meridional paroxysms of the interlunar intervals to defer their attacks, to abate in their violence, and finally to terminate and disappear;—inferred,
- a. From having observed that the meridional paroxysms of the interlunar intervals seldom make their appearance first.
- b. From having observed that, in most cases, the meridional paroxysms of the interlunar intervals, pitched, as it were, upon a lower key, and were shorter and less violent than those of the lunar periods.
- c. From having observed that the meridional paroxysms of the interlunar intervals did, in most cases, become gradually less violent and shorter from the beginning of the interval to the end; or finally terminate and disappear.
- d. A prevailing tendency in their intermeridional remissions to be more perfect and distinct than those of the lunar periods, and to continue longer;—inferred,
- e. From having observed, that, in most cases, the symptoms of remission were more perfect and distinct, and continued longer, than in the lunar periods.

2. And,

2. And during the novilunar and plenilunar periods it is very nearly the same; and also during their respective interlunar intervals;—inferred,

A. From a prevailing tendency in the symptoms of their paroxysms and remissions to be nearly the same;—inferred,

a. From having always observed the symptoms of their paroxysms and remissions to be nearly alike.

3. At the beginning and end of which, (the interlunar intervals), it seems to be greater than in the middle;—inferred,

A. From some degree of tendency in fevers to commence their attacks at the beginning and end of the interlunar intervals;—inferred,

a. From having frequently observed attacks both at the beginning and end of the intervals.

B. From their being little or no tendency in fevers to attack in the middle of the interlunar intervals;—inferred,

a. From having seldom, and almost never, observed fevers making their first attacks in the middle of the interlunar interval.

PART II.

C.

THE

THE ANALYSIS OF AXIOM THIRD.

AXIOM III. Contains propositions which, having been inferred from very general observations, do not admit of a minute analysis. There is reason, however, to believe that they have a foundation in nature. We therefore recommend an attention to those experiments and observations by which this question may be decided. Although we have fixed the limits of the equinoxial periods in an arbitrary manner, we are rather inclined to think that their influence extends beyond the bounds which we have prescribed.

CHAP.

CHAPTER III.

REMARKS ON THE ANALYSIS.

SECTION I.

REMARKS ON THE ANALYSIS OF AXIOM FIRST.

ARTICLE I.

THE IDEA GIVEN OF THE URINE IN THE PRECEDING ANALYSIS BEING TOO GENERAL FOR USE, AN ATTEMPT IS MADE TO GIVE ONE MORE PRECISE, BY EXHIBITING AN IDEA OF ITS APPEARANCE IN A FORM OF TWENTY-ONE DAYS.

V.

i. **A** FIXED and precise idea of the appearances of the urine in fevers, fit to guide the judgment respecting past, present, and future events, and to direct our practice in the cure of these disorders, we may

may venture to affirm is at this day a desideratum in medicine. The idea which I have been led to form, from long and attentive observation, appears to me to be fixed and precise. I think it has guided my opinions with certainty, and my practice with success; and it is therefore a principal purpose of the present essay to explain it to the public.

But, as the idea which we have given of the appearances of the urine in the preceding analysis is too general for use; and, on the other hand, as it would be impossible to detail them in all the different forms of fever, without increasing this treatise to an immense size; which, after all, would be too various and multifarious for the purpose of a practical rule, I shall now endeavour to illustrate the whole class by one example, which, if fixed and retained in the mind, may, with attention to a few variations, be readily applied to explain every case that may occur.

VI.

1. It appears from the preceding analysis, that the truth of the different propositions contained in these axioms

axioms must rest ultimately on such observations as have led us to infer, that the febrile paroxysms are always distinguished by a superior degree of violence or intenseness in the symptoms; and, above all, by the *urine* being *more thin* than in the remissions; and that the febrile remissions are always distinguished by an inferior degree of violence or intenseness in the symptoms; and, above all, by the *urine* being *less thin* than that in the paroxysms.

VII.

1. With respect to the *symptoms* independent of the urine, although the relative degree of their violence or intenseness are readily distinguished by a person of experience, and the presence of the paroxysms and remissions at any particular time are thereby determined at once, without hesitation or doubt in his own mind, yet the positive degree or height of none of the symptoms, except that of the pulse, and heat of the body, can be mathematically measured and recorded, so that their degree at one time may be mathematically compared

pared with their degree at another ; and the state, even of the pulse and heat, is liable to variation from different accidents, and cannot always be assumed as a just representative of the real state of the fever. Owing to these circumstances, the opinion and report of every physician respecting the presence of paroxysms and remissions, and consequently respecting their coincidence with certain fixed periods of time, when inferred from the symptoms only, must be subject to mistake, and cannot afford the assurance or certainty of demonstration.

IV

VIII.

1. Becoming, after the publication of my first treatise on the influence of the moon in 1784, more and more convinced of the truth of the theory I had advanced, and of the great extent of its application and importance, I became, in proportion, more and more anxious to make it known ; and saw, with concern, the fallibility of the testimony arising from the symptoms alone, and the difficulty of conveying to others, with
all

all its force, the combination of circumstances by which I was convinced myself. From this consideration, hoping that they would afford some evidence less equivocal, I was induced to pay more attention to the appearances of the urine than I had done before.

The symptoms of the *nocturno meridional paroxysms* and *morning intermeridional remissions* being the most remarkable, and more immediately contrasted with each other, drew my attention first; and the following Table contains the principal distinctions that were observed, arising from the state and appearance of the colouring and colourless matter.

1. *Red lutulent urine*, which is red urine, exhibiting equally through the whole of its substance some degree of opaque or muddy appearances without any mixture of cloud or powder.—(Natural urine, which is urine opaque in a greater degree, is called *luteose urine*, and is of two kinds, *red* and *yellow* *).

2. *Red*

* Vide the note marked A. at the end.

2. *Red nubiferous urine*, which is red urine, exhibiting one or more mucus-like clouds suspended in it, and is of two kinds, or rather degrees, viz.

a. *Red nubilated urine*, so called when the cloud is single, and considerably large and opaque.

b. *Red nubeculated urine*, so called when, instead of a single and compact cloud, there appear several thin light nubeculae.

3. *Red nubipulvisiferous urine*, which is red urine exhibiting a combination of cloudy and powdery matter.

4. *Red pulvisiferous urine*, which is red urine, exhibiting a powdery matter suspended in it, which at first gives a turbid appearance, and soon falls to the bottom, and forms a sediment, sometimes pale, and sometimes lateritious,

5. *Limpid urine*, is urine which exhibits no appearance of matter either colouring or colourless, and is pure like distilled water.

IX.

1. Conceiving, from the theory of fevers in general, that the presence of the paroxysms and remissions of these fevers would always be discovered by the state of the febrile spasmodic stricture; that the state of the febrile spasmodic stricture would be ascertained by the state of the urine's thickness or consistence; and, ultimately, that the state of the urine's consistence would be ascertained by the state of the *colourless matter*; I was led, from this chain of anticipation, to keep my attention fixed upon *the colourless matter alone abstracted from every other quality*. By this means, I discovered the following distinctions or characters in the urine, arising from the different forms in which the colourless matter made its appearance at different stages of the disease.

1. *Lutulent urine*, which is urine exhibiting equably, through the whole of its substance, some degree of opaque or muddy appearance, without any mixture of cloud or powder.

D

2. *Nu.*

2. *Nubiferous urine*, which is urine exhibiting one or more mucus-like clouds suspended in it, and is of two kinds, or rather degrees, viz.

a. *Nubilated urine*, so called when the cloud is single, and considerably large and compact.

b. *Nubeculated urine*, so called when, instead of a single, compact, and considerable cloud, there appear thin light nubeculae.

3. *Nubipulviferous urine*, which is urine exhibiting a mixture of cloudy and powdery matter.

4. *Pulviferous urine*, which is urine exhibiting a powdery matter suspended in it, which at first gives it a turbid appearance, and soon falls to the bottom, in the form of a sediment.

X.

1. These distinctions or characters arising from the state of the colourless matter being ascertained, I at length discovered that certain characters were constantly

stantly connected with certain periods and revolutions of the disease, and in the following manner

Respecting the first lunar period.

That, during the nocturno-meridional paroxysms, the urine constantly became *less lutulent* * than it was in its natural state; and continued so during this period.

That, during this period, the urine of the nocturno-meridional paroxysms was constantly *less lutulent* than the urine of their respective intermeridional remissions.

Respecting the first interlunar interval.

That, upon passing from the first lunar period into the first interlunar interval, the urine, from being only
lutulent,

* Sometimes, when the fever is high, the urine will become perfectly *limpid* in the paroxysms of this period; and, on the other hand, when the fever is moderate, the urine will exhibit the appearance of a cloud: But these exceptions are to be considered as deviations only from the general tendency which prevails at this period.

lutulent, generally became *nubilated* *; and continued so during this interval.

That, during this interval, the urine of the nocturno-meridional paroxysms were constantly *less nubilated* than the urine of their respective intermeridional remissions.

Respecting the second lunar period.

That, upon passing from the first interlunar interval into the second lunar period, the urine, from being *much nubilated*, became *nubilated in a less degree* †, and

* In order to see this change distinctly, it is necessary to watch the urine of the intermeridional remissions, especially that of the morning, on the 4th, 5th, and even the 6th day, after the day of the change and full of the moon; but the urine seldom fails to shew some appearance of cloud in the course of this interval, however late it may appear.

† I have seen the urine in the paroxysms of this period losing its cloud, become again *lutulent*, and even *limpid*.

and sometimes *nubeculated*; and continued so during this period.

That, during this period, the urine of the nocturno-meridional paroxysms were constantly *less nubilated or nubeculated*, than the urine of their respective intermeridional remissions.

Respecting the second interlunar interval.

That, upon passing from the second lunar period into the second interlunar interval, the urine, from being nubilated or nubeculated, generally became *nubipulvisferous* or *pulvisferous*, and continued so during part * or whole of this interval.

That,

simpid. But these are deviations from the general rule, and do not happen when the fever is well treated from the beginning.

* Although the slight nocturno-meridional paroxysms should continue for some time during this interval, it will be remembered that the remarkable change which takes place at the commencement of it is considered (when the fever

That, during this interval, the urine of the nocturno-meridional paroxysms, so long as these were observable, was constantly *less nubipulvisiferous* or *pulvisiferous* than the urine of their respective intermeridional remissions.

Respecting the lunar periods, and interlunar intervals, in fevers continuing beyond the second interlunar interval,

In fevers running on through more distant lunar periods and interlunar intervals, the urine of the second lunar interval, in such cases, is not always uniform or constant in its appearance. Sometimes it becomes only *nubilated*, or *nubeculated* in a greater degree, than it was in the preceding lunar period; and sometimes the *nubiferous* and *pulvisiferous* state appearing to be united,

fever terminates in it,) as the *final crisis* of such forms; which of course constitute forms of 21 days. This matter is fully explained in our Treatise on Putrid Intestinal Remitting Fevers, page 40.—47.

* sediment partaking of both is deposited at the bottom *.

As the fever advances through lunar periods and interlunar intervals still more remote, if the fever has been properly treated, the grosser mucus and powdery particles, which gave the urine these appearances, being at length carried off or exhausted, a greater or less proportion of thin light *nubeculae*, floating in different places; or of a *fine powdery deposition*, are now the only circumstances in the state of its consistence that distinguish the lunar periods from the interlunar intervals, and the meridional paroxysms from the intermeridional remissions.

XI.

1. The *diurno-meridional paroxysms*, and their respective evening *intermeridional remissions*, we have observed

in

* The *nubipulvisiferous* state of the urine is a common thing in all the *intermediate* or imperfect crises, as well as in those which prove *final* and perfect; and it is not easy to predict from this circumstance alone whether it is to prove an *intermediate* or *final* crisis.

in our Treatise *, are obvious only at certain stages of the disease ; but, so far as we have been able to discern them, the appearances of the urine in their paroxysms and remissions are perfectly analogous to those of the nocturno-meridional paroxysms, and their respective morning intermeridional remissions. If, disappearing or becoming obscure at certain times, they do not, like them, exhibit so continued a chain of coincidences to prove the connection of paroxysms with meridional periods, and of remissions with intermeridional intervals, from the beginning to the end of fevers, they, however, concur, when they do appear, to strengthen the evidence afforded by the urine in the nocturno-meridional paroxysms ; and shew that the action of sol-lunar influence is uniform and constant ; and, in similar circumstances, displays a tendency to exert itself in a similar manner, though not exactly with equal effect : The cause of which deviation may perhaps be discovered hereafter.

XII.

■ On Putrid Intestinal Remitting Fevers.

XII.

1. It appears, by the method which we have adopted for examining the urine, that all the different changes which have been remarked in its consistence may be referred to various proportions of muddy, cloudy, or powdery particles; all which may be comprehended under the general term of *colourless matter*, and thus distinguished from the particles which give the urine its colour; which may therefore be denominated *colouring matter*.

2. Although the *colouring matter*, at the beginning of fevers, always becomes *red*, and generally continues to be more or less of this hue, so long as the paroxysms return with any force; yet, if the bowels have been kept sufficiently open, or if bark has been given in any considerable quantity, it will again approach to its natural *amber* or *yellow* colour, and remain in this state for many days previous to the final termination of the disease.

3. But,

3. But, with respect to the colouring matter, we have now to observe, that, whether it be yellow or red, the changes which it undergoes in the meridional paroxysms and intermeridional remissions are in degree analogous, and in time coincident with those which take place in the matter which we have denominated colourless. That is to say, that, as the colourless matter, whether muddy, cloudy, or powdery, appears throughout the disease in *less quantity* during the meridional paroxysms than the intermeridional remissions, in like manner does the urine at these times become less high in its colour than in the remissions; or, in other words, contains the colouring matter in a *smaller proportion*. And thus it appears that the fluctuation which takes place in the state of the colourless matter, and in that of the colouring matter, both unite to demonstrate the prevailing tendency of the urine to be *more thin* during the paroxysms than it is in the remissions.

4. Remarkable changes also in the colouring matter, analogous in degree, and coincident in time, with those observed in the colourless matter, constantly hap-

pen

pen on the first, second, or third day, after the transition from the lunar periods into the interlunar intervals, and on the first, second, or third day, after the transition from the interlunar interval into the lunar periods ; and mutually concur to demonstrate that it is likewise the prevailing tendency of the urine to be *more thin* during the lunar periods than it is in interlunar intervals.

XIII.

1. Having obtained this knowledge, (IX. X. XI. XII.), I found myself possessed of a criterion far superior to that which arose from the contemplation of the other symptoms. These appearances in the urine, like astronomical observations taken at sea, which correct and adjust the common reckoning of the ship's course, concurring uniformly and proportionately with corresponding degrees of intension and remission in the febrile symptoms, established at once the presence or absence of the paroxysms at particular times, upon the testimony of ocular demonstration ; and enabled me to

decide

decide with confidence respecting these coincidences of the febrile paroxysms and remissions with the meridional periods and intermeridional intervals, on the reality of which the whole of this doctrine ultimately depends.

2. It was therefore my original intention to make my observations on the urine the foundation of my induction respecting the sol-lunar influence. But, finding myself under the necessity of publishing my Treatise on Putrid Intestinal Remitting Fevers when I was unequal to the task of giving them that degree of perspicuity which they required, I thought it better to confine myself to general expressions respecting the grounds of my reasoning, than run the risk of becoming confused or obscure by an arrangement not perfectly precise or clear.

XIV.

1. Such being the use and importance of examining the urine, I have endeavoured, in the following analysis, to exhibit an idea of the ordinary changes which it undergoes in one of the most common forms of fever, viz. a form of 21 days, where laxatives were

were chiefly employed for the cure, and little or no bark given to alter its natural appearance *. hoping that this single example will serve as a clue by which future inquirers may be directed in carrying on their observations through all the various forms of these fevers, whether they belong to the class of those which make their first attack in the lunar periods, or of those which make their first attack in the interlunar intervals.

Explanation

* I think the evident effect of the bark, when given at the rate of 6 or 8 drams a day, is soon to change the urine to a yellow or at least a lighter colour; but, unless it stop the paroxysms, although it may diminish, it does not prevent, the daily or septenary fluctuations in the state of the colourless matter.

Explanation of the opposite Analysis.

(i. i. i.) Although the symptoms of the evening intermeridional remissions become obscure towards the 4th day of the lunar periods, it is possible that an evident tendency to remit at this time may be discovered by some appearances in the urine, if examined with sufficient attention. The observations which I have made myself being imperfect, I have left the character of the urine in the evening intermeridional intervals of the 5th, 6th, and 7th day, to be filled up hereafter.

N. B. d. m. p. signifies diurno-meridional paroxysm.

e. i. r. ——— evening intermeridional remission.

n. m. p. ——— nocturno-meridional paroxysm.

m. i. r. ——— morning intermeridional remission.

*The Appearances of the Urine exhibited in the Analysis of a
Form of Twenty-one Days.*

In the 1st lunar period,

On the 1st day,

In the d. m. p. less, *Latulent*
~~urinated and voided~~
~~less.~~ (i.)

e. i. r. more.

n. m. p. less.

m. i. r. more.

On the 2d day,

d. m. p. less.

e. i. r. more.

n. m. p. less.

m. i. r. more.

On the 3d day,

d. m. p. less.

e. i. r. more.

n. m. p. less.

m. i. r. more.

On the 4th day,

d. m. p. less.

e. i. r. more.

n. m. p. less.

m. i. r. more.

On the 5th day,

d. m. p. less.

n. m. p. less.

m. i. r. more.

(i.)

On the 6th day,

d. m. p. less.

n. m. p. less.

m. i. r. more.

(i.)

On the 7th day,

d. m. p. less.

n. m. p. less.

m. i. r. more.

(i.)

Explanation

Explanation of the opposite Analysis.

(k. k. k. k.). In our Treatise on Putrid Intestinal Remitting Fevers, page 31. we have said that the meridional paroxysms, after having gone through the first lunar period, become, after the commencement of the interval, much more slight and obscure, and generally nocturnal; and therefore, to express this tendency in the *Tables* of that Treatise, we have made use of *single dots* only. To express it in this Table, we have inserted nocturno meridional paroxysms only, and their respective morning intermeridional remissions, to the urine of which my observations are chiefly confined.

(? ? ?) With respect to the nocturno-meridional paroxysms of this interval, I must farther observe, that the tendency of every succeeding paroxysm is to return at a later hour than the former; and towards the end of the interval, I have observed headaches and other symptoms of the paroxysm defer their attack till five and six in the morning, and continue, during the remaining part of the morning intermeridional interval. But my observations at this time are imperfect; and the rule of such ^{deviations} ~~observations~~ must be ascertained hereafter. To express our uncertainty upon this point, we have in this Table distinguished the nocturno-meridional paroxysms of the 5th, 6th, and 7th day, by a mark of interrogation or doubt.

In the first interlunar interval,

On the 1st day,

In the . . .

n. m. p. less nubilated. (k.)

m. i. r. more.

On the 2d day,

n. m. p. less. (k.)

m. i. r. more.

On the 3d day,

n. m. p. less. (k.)

m. i. r. more.

On the 4th day,

n. m. p. less. (k.)

m. i. r. more.

On the 5th day,

n. m. p. less. (?)

m. i. r. more.

On the 6th day,

n. m. p. less. (?)

m. i. r. more.

On the 7th day,

n. m. p. less. (?)

m. i. r. more.

F

Explanation

Explanation of the opposite Analysis.

(L) In our Treatise on Putrid Intestinal Remitting Fevers, page 31. we have observed that the meridional paroxysms having entered into a 2d lunar period, suffer an exacerbation nearly similar to that which they have suffered in the first. This exacerbation, however, does not always shew itself in the first day of this period, either in the symptoms, or urine; neither must we expect to find their evening intermeridional remissions at the beginning of this period so distinctly marked as those in the first lunar period. Their obscurity toward the end is represented, as it is in the first lunar period, by leaving the character of the urine in the evening intermeridional intervals of the 5th, 6th, and 7th day, to be filled up hereafter.

In

In the 2d lunar period,

On the 1st day,

In the d. m. p. less nubilated or nubeculated. (l.)

e. i. r. more.

n. m. p. less.

m. i. r. more.

On the 2d day,

d. m. p. less.

e. i. r. more.

n. m. p. less.

m. i. r. more.

On the 3d day,

d. m. p. less.

e. i. r. more.

n. m. p. less.

m. i. r. more.

On the 4th day,

d. m. p. less.

e. i. r. more.

n. m. p. less.

m. i. r. more.

On the 5th day,

d. m. p. less.

. . .

n. m. p. less.

m. i. r. more.

On the 6th day,

d. m. p. less.

. . .

n. m. p. less.

m. i. r. more.

On the 7th day,

d. m. p. less.

. . .

n. m. p. less.

m. i. r. more.

In the second interlunar interval,

On the 1st day,

In the . . .

n. m. p. less nubipulviferous or
pulviferous.

m. i. r. more.

&c. &c. &c.

ARTICLE II.

THE APPEARANCES OF THE URINE IN THE FORM OF 21
DAYS WILL SERVE TO ILLUSTRATE ITS TENDENCY IN
ALL THE FORMS WHICH MAKE THEIR FIRST ATTACKS IN
THE LUNAR PERIODS.

XV.

1. These variations which we have described (IX. X.)
in the consistence of the urine are generally sufficiently
obvious to a careful observer, continuing his attention,
at certain hours of the day and night, from the begin-
ning of the disease to its termination; and the tenden-

cy.

of the urine in the form of 21 days, which we have given as an example, with some allowances, will serve to illustrate the changes which it undergoes in all fevers making their first attack in the lunar period, whether they terminate in the 1st interlunar interval; in the 2d, like the example; or in interlunar intervals still more remote.

2. Respecting forms that terminate in the 1st interlunar interval, the character of the urine, in the 1st lunar period, being, like that of the example, generally *tutulent*, and not nubiferous or pulviferous, indicates a tendency to be thin, similar to that of the example; and the paroxysms and remissions of this period are also distinguished by a similar fluctuation in the state of its general character.

Upon the commencement of the first interlunar interval, the urine in these forms (2.) undergoes a change similar also to that in the example, becoming then *nubiferous*; and, when the fever is about to terminate, generally *nubipulviferous* or *pulviferous*—thus indicating at this time a similar tendency to be *thick*. The urine of the paroxysms and remissions, as long as they continue

continue to return, is constantly distinguished by a fluctuation similar to that in example, in the state of the general character, whether it be *nubiferous*, *nubipulvisiferous*, or *pulvisiferous*.

3. Respecting forms beginning like the example in the lunar period, and terminating in the second interlunar interval, the changes and appearances of the urine are nearly coincident, analogous, and similar.

4. Respecting the forms of fevers running on to terminate in interlunar intervals beyond the second, I have shortly to observe, that, in the lunar periods, and interlunar intervals, through which they pass, *previous to the commencement of the 3d lunar period*, a tendency to be *thin* during the former, and *thick* during the latter, similar to that in the example, is to be discerned in the urine, and that similar changes are to be observed in passing from the one to the other; and that a similar fluctuation in that state of its consistence which forms its general character in different lunar periods, and interlunar intervals, uniformly distinguishes the meridianal paroxysms and remissions of each. But, *after the commencement of the 3d lunar period*, as the
 symptoms

symptoms of the meridional paroxysms in such cases generally become, if the disease has been well managed, much less violent, and the lunar periods, of course, less strongly distinguished, so have we to observe respecting the urine, that its general character, in different lunar periods and interlunar intervals, the changes which these general characters undergo in passing from the one to the other, and the fluctuation which takes place in the state of these general characters, in the meridional paroxysms and corresponding remissions, all in like manner become less conspicuous and distinct than before. And, as it often happens in the later stages of fevers protracted beyond the commencement of the 3d lunar period, that the symptoms of exacerbation, which distinguish the general character of the lunar periods, do not shew themselves before the 4th, 5th, 6th, and even 7th day of these periods, so the urine corresponding always with the state of the fever often manifests no obvious change in its appearance, until one or other of these later days which I have specified.

ARTICLE

ARTICLE III.

THE APPEARANCES OF THE URINE IN THE FORM OF 21 DAYS
WILL SERVE ALSO TO ILLUSTRATE ITS TENDENCY IN ALL
FEVERS WHICH MAKE THEIR FIRST ATTACK IN THE IN-
TERLUNAR INTERVALS.

XVI.

1. With respect to fevers making their first attacks
in the interlunar intervals, as there is one remarkable
difference to be observed between them and fevers
making their first attacks in the lunar periods in the
state and progression of their symptoms, so there is, in
like manner, a remarkable difference between them in
the appearance of the urine. In fevers attacking in the
lunar periods, the symptoms become quickly more and
more violent every day, and generally get to their
greatest height before the end of the period in which
they attack ; and the urine presently acquires the cha-
racter

character of being less muddy, or more clear and thin, than its natural state. In fevers attacking in the inter-lunar intervals, the symptoms, during the interval in which they attack, generally shew little inclination to become violent, and the urine seldom acquires that degree of clearness or thinness which marks the character of the urine in the beginning of fevers making their first attack in the lunar periods.

2. When fevers attacking in the interlunar intervals enter the first lunar period, the symptoms and urine then assume the character peculiar to fevers making their first attack in the lunar period, and then becoming, as it were, coincident and analogous to them, they proceed in a similar manner through the rest of their course.

3. After having remarked the difference (1.) to be observed in the urine of these two distinctions of fevers during their first stage, we have only to add, that due regard being paid to that exception, the urine in the form of 21 days may be assumed to illustrate the state

G

and

and variation of the urine in all forms making their first attack in the interlunar intervals, as well as in those which make their first attack in the lunar periods.

CHAPTER

CHAPTER IV.

INFERENCES DRAWN FROM THE ANALYSIS.

SECTION I.

RESPECTING THE ACTION OF THE SOL-LUNAR INFLUENCE ON THE CONDITION OF THE SPASMODIC STATE IN PUTRID INTESTINAL REMITTING FEVERS.

XVII.

1. **I**N collecting the sum of these observations, it appears that the urine of different meridional paroxysms through which fevers pass is constantly distinguished by some peculiar appearance, indicating *a greater degree of thinness* than in the intermeridional remissions.

sions ; and farther, that the urine of meridional paroxysms happening in the lunar periods, is constantly distinguished by some peculiar appearance, indicating *a greater degree of thinness* than in the urine of meridional paroxysms happening in the interlunar intervals : So that there is to be observed in the state of the urine a *fluctuation* coincident with that of the ocean, respecting the times of the alternate changes which both undergo daily ; and also those which they undergo in the lunar periods and interlunar intervals, in a manner so remarkable and striking, that no man who is capable of making a proper distinction between the nature of induction and fiction, can possibly incline to disjoin them, or refer them to different causes.

But it is universally allowed that the peculiar thinness of the urine, which distinguishes the paroxysms of fevers, is produced by a *spasmodic affection*, or diseased constriction of the small vessels through which it passes, connected with a similar affection extending itself, at the same time, to other parts, and probably, in some degree, over the whole vascular system. We therefore infer from these premises the following theorem.

THEOREM

THEOREM I.

That the peculiar thinness of the urine in the paroxysms of putrid intestinal remitting fevers is owing to a spasmodic affection or diseased constriction of the vascular system ; that the fluctuation which we have described in the state of its thinness, at certain periods and intervals of the day and month, is owing to a corresponding fluctuation in the state of that spasmodic affection ; and ultimately, that the fluctuation which takes place in the state of that spasmodic affection cannot reasonably be referred to any other cause than a corresponding fluctuation in the state of that influence which produces the ebbing and flowing of the sea, with which it constantly coincides in point of time.

SECTION

SECTION II.

RESPECTING THE ACTION OF THE SOL-LUNAR
INFLUENCE ON THE CONDITION OF THE FE-
BRILE SPASMODIC STATE IN ALL OTHER FE-
VERS.

XVIII.

i. Sensible of the fallacy of reasoning from analogy, and of the great abuse that has been made of it in medicine, I have carefully abstained from drawing a single argument from phenomena which I did not observe myself in fevers decidedly putrid, intestinal, remitting, and infectious. Bilious remitting and intermitting fevers, where infection was not so evident or certain, especially those connected with a diseased liver, which I have seen beyond number returning regularly at the lunar periods for several months, and in many cases for years together, afforded evidence of the sol-
lunar

lunar influence still more striking than the fevers of which I have treated. But the analogy being questionable, I was unwilling to expose a doctrine of such importance to any objection of this kind, by employing it.

Analogy, however, is by no means to be rejected altogether; and, from what I have established respecting putrid intestinal remitting fevers, from what I have seen in bilious, and all other kinds of fevers *, and from what Dr Mead, Dr Lind, Dr Jackson, and the different authors to whom they refer, have observed on this subject †, I think there is much reason to admit the probability of the following proposition upon this ground.

THEOREM

* Vide B. at the end of this Treatise.

† Vide Dr Jackson's Treatise on the Connection of the New and Full Moon with the Invasion and Relapse of Fevers, in the London Medical Journal for 1787; and also his Treatise on the Fevers of Jamaica in 1791; Dr Mead's Treatise on the Influence of the Sun and Moon, &c.; Dr Lind's Thesis, &c.; and my Treatise published at Calcutta.

THEOREM II

That the sol-lunar influence regulates the condition of the febrile spasmodic state, or diseased constriction of the vascular system, in every disorder without exception, where the smallest degree of periodical febrile paroxysm exists, in the same manner that it does in fevers that are putrid, intestinal, and remitting.

SECTION III.

RESPECTING THE ACTION OF THE SOL-LUNAR INFLUENCE ON THE CONDITION OF THE SPASMODIC OR CONSTRICTIVE STATE OF THE VASCULAR SYSTEM IN OTHER DISEASES, AND IN HEALTH.

XIX.

i. Proceeding on the analogical conclusion we have admitted respecting fevers, and on various observations made in other diseases *, and in the case of certain derangements and revolutions ** in weak and delicate constitutions;

^a My observations on the sol-lunar influence in India have not been confined to fevers. Epilepsies, paralytic affections, headachs, inflammations of the eyes †, asthmas, phthifical coughs, gouts, rheumatisms, toothachs, pains and swelling of the liver and spleen, diarrhoeas, colics, costiveness, complaints in the urinary passages, boils ‡, ulcers, sores, and eruptions of various kinds, very often assumed an intermittent form, and returned regularly with the full and change of the moon, and disappeared or diminished with the intervals.

† Vide C. at the end of this Treatise.

‡ Vide D. at the end of this Treatise.

** Under this head I consider the fits of teething in children, attacks of the haemorrhoids, child-bearing, and those revolutions which take place monthly in the constitution of females. With respect to the three former I

PART II.

H

have

constitutions, I will venture to advance another proposition, the truth of which I presume will also be confirmed by future observation.

THEOREM III.

That there is much reason to believe that the solar influence regulates the condition of the spasmodic or constrictive state of the vascular system, in all other diseases ; and affects it even in health.

SECTION

have constantly observed them very much connected with the change and full of the moon ; and, respecting the last, although I have taken no pains to ascertain it, yet I have met with many occurrences which induce me to refer it to the same cause.

SECTION IV.

RESPECTING THE SUFFICIENCY OF THE SPASMODIC OR CONSTRICTIVE STATE OF THE VASCULAR SYSTEM TO PRODUCE THE PAROXYSMS AND CHANGES IN FEVER, AND OTHER DISEASES; AND CERTAIN DERANGEMENTS AND REVOLUTIONS IN HEALTH.

XX.

1. In the preceding propositions, we have been led to infer that *the sol-lunar influence regulates the condition of the spasmodic or constrictive power of the vascular system, in diseases and in health.* We are now to infer that the condition of the constrictive power of the vascular system, and its action, is a circumstance upon which the state of disease and health in a great measure depends; and that different variations in the degree, and distribution of this constrictive power, with other circumstances that must be included and considered, are

sufficient

sufficient for explaining all the revolutions which take place in these two states. It is not, however, my intention, at this time, to enter into a particular proof of this inference. We know that wonderful effects may be produced by a *general relaxation or constriction of the whole vascular system*. We also know what changes may be effected by a *relaxation or constriction confined to a particular organ or part*. From these two considerations, we can easily conceive, and safely infer, the extensive influence of the constrictive power of the vascular system; and on this ground we propose the following proposition,

THEOREM IV.

That the condition or state of the constrictive power and action of the vascular system is a circumstance upon which the state of disease and health in a great measure depends; and that different variations in the degree and distribution

of

of this constrictive power, with other circumstances to be included and considered, are capable of explaining all the revolutions which take place in health and disease.

2. In what manner, or by what means, the sol-lunar influence acts upon the condition of the constrictive power of the vascular system, we do not at present pretend to say: But we shall not despair of seeing a rational solution of this question, upon principles connected with those which have been demonstrated by the immortal Newton,

SECTION V.

RESPECTING THE VIS MEDICATRIX NATURÆ.

XXI.

1. Collecting from these propositions that there is reason to believe that the sol-lunar influence presides over the condition of the spasmodic or constrictive state

state of the vascular system in fevers, all other diseases, and in health; and in fevers, all other diseases, and in health, produces these remarkable efforts and changes which hitherto have been referred by physicians to a power existing in the constitution itself, and acting independently of any external agent; in short, to the *vis medicatrix naturae*, we obtain a new proposition in medicine of singular extent and importance, viz.

THEOREM V.

That there is reason to believe that the celebrated vis medicatrix naturae, the producer of paroxysms, the giver of remissions, the deity of some physicians, the devil of others, is nothing more than the sol-lunar influence exerting itself upon the condition of the constrictive power of the vascular system, in disease and in health, according to laws that are uniform and universal.

2. Having shewn that there is reason to believe the existence and sufficiency of a particular cause, the first rule * of philosophy forbids us to admit or suppose another; with respect to this ideal divinity, *the vis medicatrix*, we therefore pronounce, in the words of the poet,

"Nullum numen abest si fit prudentia."

SECTION VI.

RESPECTING THE EXTENT OF THE SOL-LUNAR INFLUENCE OVER THE UNIVERSE.

XXII.

1. In the course of this investigation, it appears to be probable that the dominion of the sol-lunar influence

* Vide Newton's Principia Reg. Philosoph. 1.

influence over the human race is uniform and universal.

In the diseases of horses and dogs in India, I have on many occasions observed the meridional periods marked by extraordinary paroxysms; and, in the lunar periods, I have seen these extraordinary paroxysms distinguished by an uncommon degree of exacerbation.

That the constitution of certain birds and fishes undergoes a regular change corresponding with the revolutions of the moon, is a fact established by the observation of every age, in different quarters of the globe.

2. With respect to vegetables, it has been observed by Dr Mead, that husbandmen are regulated by the moon in planting and managing trees; and extraordinary effects are ascribed by farmers to the full moons of harvest, which cannot proceed from any increase of heat communicated by the lunar rays. But I do not know that any direct experiments have been made, by which we might infer the sol-lunar influence in the vegetation of plants, independent of the effects that

may

may be produced by its action on the state of the atmosphere which furrounds them.

3. With regard to the effects of the sol-lunar influence on the state of the atmosphere, although observations concerning them have not been reduced to any regularity or system, they seem, however, to be universally admitted. Neither have my own observations been sufficiently particular or precise. But I can declare, in general, that, in India, the meridional periods, both diurnal and nocturnal, were distinguished by remarkable changes or paroxysms in the state of the weather; and that these paroxysms were most remarkable at the lunar periods.

4. The connexion of the ebbing and flowing of the sea with the sol-lunar influence is acknowledged by all mankind, wherever there is an opportunity of observing it.

5. Taking a comprehensive view of this subject, I think there is much reason to believe that all the different kingdoms of nature, at least the animal, vegetable, and atmospheric and aqueous departments, are

under the dominion of solar influence ; and that, like the animal constitution, they are subject to daily and monthly revolutions.

Finally, if philosophers, in all the departments of nature, could be prevailed upon to take the trouble of distinguishing and arranging the phenomena of the different hours of the day, and of the different days of the month, according to the divisions of time which are suggested by their coincidence with particular relative positions of the sun and moon, I think it is possible that the phenomena collected under the different divisions of this arrangement might present different collective or general characters, which did not appear before ; and that these characters discovering one common corresponding tendency in all, might at last enable us to infer upon the foundation of a perfect induction,

THEOREM

THEOREM VI.

*That the sol lunar influence exerts its dominion, in
some degree, over every production ; and in e-
very operation and revolution of nature.*

F I N I S.

POSTSCRIPT.

THEOREM IV

Let α be a real number, and let β be a positive real number. Then there exists a unique real number γ such that $\alpha + \beta\gamma = 0$. This number γ is denoted by $-\alpha/\beta$.

Proof. Let α and β be as above. Consider the set $S = \{x \in \mathbb{R} : \alpha + \beta x \leq 0\}$. This set is non-empty, for $\alpha + \beta(-\alpha/\beta) = 0$. Moreover, S is bounded above, for if $x \in S$, then $\alpha + \beta x \leq 0$, and hence $x \leq -\alpha/\beta$. By the completeness property of the real numbers, S has a least upper bound, which we denote by γ . We claim that γ is the unique real number such that $\alpha + \beta\gamma = 0$.

First, we show that $\alpha + \beta\gamma \leq 0$. Suppose, to the contrary, that $\alpha + \beta\gamma > 0$. Then $\gamma \in S$, and hence $\gamma \leq -\alpha/\beta$. But then $\alpha + \beta\gamma < 0$, which contradicts our assumption that $\alpha + \beta\gamma > 0$. Therefore, $\alpha + \beta\gamma \leq 0$.

Next, we show that $\alpha + \beta\gamma \geq 0$. Suppose, to the contrary, that $\alpha + \beta\gamma < 0$. Then $\gamma \in S$, and hence $\gamma \leq -\alpha/\beta$. But then $\alpha + \beta\gamma < 0$, which contradicts our assumption that $\alpha + \beta\gamma < 0$. Therefore, $\alpha + \beta\gamma \geq 0$.

Since $\alpha + \beta\gamma \leq 0$ and $\alpha + \beta\gamma \geq 0$, we conclude that $\alpha + \beta\gamma = 0$. This shows that γ is a real number such that $\alpha + \beta\gamma = 0$. To show that γ is unique, suppose that δ is another real number such that $\alpha + \beta\delta = 0$. Then $\delta \in S$, and hence $\delta \leq \gamma$. But then $\alpha + \beta\delta = 0$, and hence $\alpha + \beta\gamma = 0$, which implies that $\gamma = \delta$. Therefore, γ is the unique real number such that $\alpha + \beta\gamma = 0$.

P O S T S C R I P T.

*Remarks on Dr Jackson's Treatise on the Fevers
of Jamaica.*

HAVING just now discovered * that Dr Jackson, in his Treatise on the Fevers of Jamaica, published in April or May 1791, has done me the honour to mention me as the author of a Treatise on Lunar Influence, published at Calcutta in 1784, and has entered into a criticism of the doctrine delivered in that Treatise, as if it were the latest and only opinion I had ever published on this subject, I cannot resist this opportunity of expressing my regret that the learned

Doctor

* Vide the Notes at the end of his Treatise, page 18.

Doctor had heard nothing of my Treatise on Putrid Intestinal Remitting Fevers, published in February or March 1790, more than twelve months before his book.

In this Treatise on Putrid Intestinal Remitting Fevers, my first imperfect notions respecting lunar influence are altered and extended, after the additional experience of five years, with opportunities of observing that do not fall to the lot of every practitioner. And, when I reflect that it was advertised and sold in London so early as June or July 1790, that it was taken notice of in the English Review for October 1790, and that an account of it appears in Dr Duncan's Medical Commentaries published at Edinburgh about the end of the same year, I cannot help considering myself as very unfortunate that it did not fall into the Doctor's hand in sufficient time to prevent his censure of my first publication.

Having, in my Preface to my last Treatise, announced the design of considering the different systems that have been written on Fevers, in a second volume, it is not my intention now to anticipate that work, by entering

tering into a review of Dr Jackson's Treatise; it, however, seems expedient, at this time, to make a few remarks upon it.

Uniting the idea of a septenary revolution in fevers, with a tendency in their paroxysms to assume particular types, or, in other words, to attack and remit at stated intervals *, Dr Jackson forms a theory, which, he conceives, enables him to explain satisfactorily all the circumstances that relate to critical days: And these septenary revolutions which Dr Jackson has adopted are entirely independent of the revolutions of the moon.

If Dr Jackson can establish the existence of two sorts of septenary revolutions, the one connected, the other totally unconnected, with the lunar periods and intervals, we must acknowledge that he has made a new and important discovery in medicine, the merit of which is due to him alone.

But,

* Vide Dr Jackson's Treatise, page 40, 65, 67, 68, &c.

But, on the other hand, if Dr Jackson's septenary revolutions were connected and coincident with the lunar periods and interlunar intervals, it will then follow that the theory, by which he proposes to account for the critical days of fevers, does not differ in any material respect from the theory suggested in our first treatise in 1784, and afterwards fully explained in our last treatise in 1790.

A reference to the dates of these septenary revolutions, in all the different cases in which they were observed, would have settled this important question at once. But, unfortunately, the Doctor's circumstantial accuracy has failed him on this occasion. Like the father of physic, whom he reprehends for a similar neglect*, he has forgotten to specify the dates of the septenary revolutions which he observed; and the reader is left in the dark, deprived of the only criterion by which he could have formed an opinion for himself with certainty.

Whatever

* Vide Dr Jackson's Treatise, page 51.

Whatever Dr Jackson's sentiments may be, at present, respecting this important point, we will venture to say, that there was a time when he certainly considered almost all * the relapses and returns of fevers at distant periods observed by him (in other words, their septenary revolutions,) as connected with the lunar periods, and dependent on the revolutions of the moon; and when he did not ascribe them to any other cause.

In proof of these observations, I beg leave to refer the reader to a paper written by Dr Jackson, and published in the London Medical Journal for 1787, Vol. 8. Part First, under the following title: "*Some Observations on the Connection of the New and Full Moon, with the Invasion and Relapse of Fevers, by Robert Jackson, M. D.*" The whole of this paper is worthy of attention, but especially the strong and pointed passages contained in page 29. 31. 32. and 33.

PART II.

K

Since

* Vide Dr Jackson's Paper on the Influence of the Moon in the London Medical Journal for 1787, page 32.

Since the publication of this paper, Dr Jackson's sentiments on this subject seem to have undergone a remarkable change. Those strong and pointed expressions respecting the influence of the moon, which I have recommended to the reader's attention, do not appear in his late work ; the connection of the relapses and returns of fevers with the periods of the moon, are mentioned as if it were only by accident, and with reserve ; and we now discover, *for the first time, the term and doctrine of septenary revolutions independent of the revolutions of the moon, with an attempt to employ them in explaining the crises of fevers.*

Why Dr Jackson might incline to introduce a term in treating of this subject different from that which he used in his first paper, is a circumstance for which it might perhaps be easy to assign some reason. But, upon what grounds he has ventured to advance an idea of the thing itself, so opposite and incompatible with what he expressed before, is beyond our conjecture. He has not been a second time in Jamaica or America ; he has collected no new observations in that quarter ; and, indeed, both publications are avowedly composed from

from the same materials. A review of the notes and memorandums which he had saved, and the recollection of those which he had lost, first led him to conclude, that the relapses and returns of fevers at distant periods which he had observed, (in other words, their septenary revolutions), were almost always connected with the lunar periods. But, how a second review and recollection of the very same notes, after an interval of four years, should incline him to infer that the revolutions which he observed were not almost always connected with the lunar periods, but with periods totally distinct and independent, *and never before mentioned, or even insinuated in his first publication*, is a circumstance which we do not comprehend, and which we leave for the Doctor to explain.

The *intermediate interlunar crises* which we have defined in our treatise on Fevers, page 45. and 46. are very often succeeded by a paroxysm commencing with a cold fit*, and other appearances, totally different from

* In treating these fevers, it is of importance to know that,

from that which they assumed in the preceding lunar period, and which we have shewn in our Treatise, page 31. is a character peculiar to the paroxysms of the interlunar intervals. An apparent recommencement of the fever, with a change of its character similar to that which we have observed to follow the *intermediate interlunar crises*, is described by Hippocrates in almost every case he has given us of any length; and a similar apparent recommencement of the fever with a change of its character has also been observed by Dr Jackson. But the particular period or interval of the moon, at which these events took place, are neither specified

that, about the time of the intermediate interlunar crises, uncommon secretions of bile are apt to take place, and to be accumulated in the intestines; and it is to this cause that I refer the cold fits which frequently shew themselves at these stages of the disease. When the bile is instantly evacuated, the fever often, in such cases, terminates finally, or at least proceeds with moderate symptoms. But, if the evacuation of the bile be neglected, or deferred too long, a bilious fever is superadded to that which existed before; and this was evidently the case in many of the histories delivered by Hippocrates; where the bile was not carried off by a natural looseness.

specified by Hippocrates, nor by Dr Jackson; and, from his neglecting to attend to this circumstance, we presume that the Doctor has permitted himself to be led astray by his new idea of septenary revolutions independent of the periods and intervals of the moon. Dr Jackson, to support his new doctrine, may perhaps be able to discover hereafter, by a reference to his notes, that these events were totally unconnected with the periods and intervals at which I have observed them. But, with what propriety will he then assume the histories of Hippocrates to support his doctrine, when their dates cannot possibly be ascertained in such a manner as to establish their exact coincidence, in point of lunar time, with his own observations?

Whatever difference may exist between Dr Jackson and me respecting the cause of septenary revolutions, it gives me great satisfaction to find that both of us concur in ascertaining a fact which has been so little attended to, *or rather totally overlooked by modern physicians.* And I must again lament that he had not met with my Treatise on Putrid Intestinal Remitting Fevers, in which the laws of the septenary revolutions of these disorders

disorders are not only minutely described in language, but delineated and illustrated by three different tables constructed for that purpose.

The laws which I have explained, are inferred by a regular induction from phenomena which are obvious, uniform, and universal. From the uniformity, universality, and constancy of nature in all ages, we infer that they were the same in the days of Hippocrates that they are now; and, consequently, that the histories of different cases of fevers to be found in his works, which in form are similar to the fevers of the present day, and therefore reconcileable and referable to the influence of the same laws, are nothing more than so many examples of their power and energy 2000 years ago; and cannot, consistently with the rules of philosophy, be referred to any other cause.

With regard to the septenary revolutions observed by Dr Jackson, presuming that the judgment which he formed upon his own observations in 1786, (when his recollection was fresh and entire, and when he decided that they were almost always connected with the revolutions

lutions of the moon), is more to be depended on than that which he formed in 1791, we cannot hesitate to draw the same conclusion.

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N O T E S.

A.

Hints respecting Bilious Fevers.

THERE occur very frequently in India fevers which seem to arise, *without any infection*, from the absorption of bile accumulated in the intestines. This increased secretion and accumulation is almost always connected with a *diseased liver*. Such fevers will often run on for weeks together, with daily paroxysms and lunar exacerbations, similar to those of infectious fevers; and it is often very difficult to distinguish them.

The *urine* of fevers *purely bilious* is always deeply tinged with bile; and changes similar to those in fevers that are infectious are to be observed in the state of the colouring and colourless matter at particular times of the day and month; and concur to demonstrate the operation of the sol-lunar influence, and the importance of attending to its laws in directing the cure.

Bilious fevers are now found to be much more frequent in northern latitudes than they were conceived to be some years ago; and I presume that it will soon be discovered that the whole tribe of diseases hitherto denominated *hypochondriac*, and so little understood, are actu-

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ally nothing more than a certain concurrence of febrile symptoms connected with a diseased state of the liver, and to be treated in a manner similar to that which is followed by the surgeons of this country who have practised in warm climates. The hypochondriac disease in India is a diseased liver; and gouts and rheumatisms are febrile states produced by the absorption of putrid and bilious matter from the intestines.

B.

Hints respecting the Small Pox.

Since my Treatise published at Calcutta in 1784, I have had an opportunity of adding very few observations to those which I had made at that time respecting the small-pox; but all of them induce me to infer that this disease is greatly affected by sol-lunar influence; and I am inclined to think that it will be found that the coincidence of the eruptive fever with the lunar periods increases the severity of the fever, and renders the pustules more numerous; on the other hand, that the coincidence of the eruptive fever with the interlunar intervals tends to moderate the fever, and to render the pustules less numerous; and that there is reason to suppose that the great diversity which appears in different cases of small-pox may be owing, in a great measure, to the communication of the infection, and the attack of the eruptive fever at particular stages of the lunar periods and interlunar intervals.

I have made a few experiments and observations in the case of patients who were inoculated, which have
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led me to these conclusions ; and I have reason to suspect, from several instances, *that the secondary fever of the small-pox caught in the natural way, which has been so fatal to mankind, is occasioned by the coincidence of the lunar periods with a certain state or stage of the disease, and does not depend, as it has always been supposed, upon any particular change connected with a particular day of its duration.*

C.

Respecting the Cure of a certain Species of Ophthalmia.

At Calcutta, Benares, and Lucnow, I have met with a species of ophthalmia attacking about the coming on of the rains in June, the proper method of treating which is probably not generally known ; that is to say, that bleeding, purging, blistering, fomenting, and applying the common colyria of Europe, have little effect in abating the symptoms, or preventing the disease from proceeding to the greatest height. This formidable disorder comes on gradually with a slight swelling in the eye-lids and inflammation in the eye, and from the very first almost they begin to discharge an humour which thickens and glues the eyes, and renders them exceedingly uneasy. Besides this, the patient is constantly seized with the sensation of a particle of sand, or some hard substance, between the eye ball and the upper eye-lid. In the space of 4 or 5 days, the inflammation of the eye has increased, in spite of all com-

mon

mon remedies, to so great a pitch, that it is unable to endure the smallest degree of light; the pain now begins to shoot through the head, and to produce a terrible headach, and the sclerotic coat swells and rises above the surface of the cornea. At night, all the symptoms are aggravated, but, towards morning, they begin to abate, and continue more moderate till the time of their exacerbation at night; and relapses and exacerbations of the disease are obvious at the lunar periods.

To cure this disorder, the bowels must be cleared by a dose of calomel at bed-time, succeeded by a glass of the cathartic salts in the morning; and the Peruvian bark in substance is then to be given in as great quantity as the stomach will bear it, until the nocturnal exacerbation is entirely stopt, or returns with little violence.

The bark puts a stop to the paroxysms of pain with great certainty; but, to unload the eye in the mean time, and to procure more *instantaneous* relief, I am now to recommend the application of an ointment which was first communicated to me by a native of India.

R.

Take one table spoonful and a half of fresh butter, keep it boiling in a glazed pot for half an hour, free it of all impurities, and then carefully mix with it in a mortar one scruple of opium and one dram of alum, previously rubbed together into an impalpable powder.

N. B.

N. B. The original recipe contained a small proportion of turmeric and nim-leaf, but not being acquainted with the effects of these articles, I was afraid, and left them out.

A little of this ointment must be infinnuated within the eye-lids all along their edges. At first, it occasions a great degree of smarting pain, which continues about a minute, after which it begins to abate, and then a thin watery discharge runs copiously down the cheeks, This operation, I think, succeeds best during the remission of the paroxysm, and produces then the greatest discharge and relief. Before I made use of it, the disease had always advanced four or five days. If it were used at the beginning, I think it is probable that it might prevent it from going to a great height.

After the bark has stopt the nocturnal exacerbation of pain, and the eyes have been unloaded by two or three applications of this ointment, preparations of lead, in the form of a lotion during the day, and of an ointment during the night, complete the cure; which, however, is often very tedious, if the disease has been severe.

D.

Respecting the Cure of the Furunculus, or Boil, which terminates by the Separation of a Tough Core.

These boils are always attended with some degree of fever, the paroxysms and exacerbations of which are affected

affected by the influence of the moon. They appear, I think, most frequently in the months of May and June, and are exceedingly painful and troublesome.

So long as the tough core remains attached to the inside of the boil by its fibres, the pain and inflammation continue without remission. But, whenever these fibres are detached or destroyed by a suppuration all around it, the pain and inflammation then abate, and may almost instantly be entirely removed, by opening the skin, and evacuating the core and other matter.

The chief object, therefore, is to effect an immediate separation of the core from the interior surface of the boil by suppuration. But, in producing this desirable change, nature is, in most cases, exceedingly tedious; and the common applications used by Europeans give her little assistance.

About eight years ago, when afflicted with this complaint, I was advised by my own servants to try an application of the leaves of the *nim tree*. The operation of this remedy was so sudden and conspicuous, that I have used it in a great number of cases which have occurred since that time with equal success. It will often produce, in the space of one or two days, what cannot be effected by common means in eight or ten; and I have therefore dedicated this note to make it more generally known.

The *nim tree* is common every where all over the country from Calcutta to Lucnow. I believe it is com-
mon

mon every where all over India, and therefore regret
less my having neglected to obtain a botanical descrip-
tion of it.

*Take a handful of the leaves of the nim tree fresh gather-
ed, and having placed them on a fragment of the common
cudgerie or earthen pot, heat them quickly on the fire with-
out drying them, or exhausting their moisture; in this
state, apply them to the boils in a heap, as hot as they can be
endured; and having fastened them on, allow them to re-
main for half an hour, when they must be relieved by a fresh
application. This operation is generally performed by the
bearers who carry the palanquin, and must be repeated till
the suppuration be completed.*

After the core is evacuated, the Emplast. Diach. cum
gum. draws the boil, and soon heals it.

